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Such diseases are often of the most virulent and destructive character, as pear blight and tomato blight; or they are wide spread and exceedingly harmful by decreasing the yield, although not killing the plant or producing marked changes in it, as the bacterial disease of oats. This latter class is not recognized as disease by the cultivator.

The literature of this subject is much scattered, and unusually fragmentary. Few of the diseases have been systematically investigated, and not one has been fully worked out. The life history of the parasite in every case still demands attention, and even the nature of the parasitism itself would be a fruitful field for study. Nevertheless, were what is already known of the subject put together, it would form a fair sized volume.

There can be little doubt that what has so far been discovered is but a beginning. The results are likely to be eventually quite as extensive and important as in animal pathology, except in so far as the latter directly affects or coincides with human pathology.

What is especially needed at this stage of advancement is the continuous and systematic examination of the whole ground by one or more well equipped investigators, and the publication of a critical statement of what may be safely accepted as proven. Even a summarization of the present status of the subject, without critical laboratory study, would be helpful, if well done.

CURRENT LITERATURE.

Biology in an attractive form.

Gibson's recently published work, which he has called "Sharp Eyes,"¹ is an admirable piece of book making, from whatever point of view considered. The work conveys much interesting, curious and useful information about plants and animals, is written in choice language, in direct narrative style, and of high literary quality, and is profusely illustrated with spirited glimpses of nature, most delicately and artistically drawn.

The author has, indeed, "sharp eyes," not only to see small objects, but to penetrate their meaning. He looked at "things not rare, nor seclusive, nor foreign, things which are to be found in almost any of our woods, or fields, or copses; and which any wide-awake saunterer

¹GIBSON, WM. HAMILTON.—Sharp Eyes, a Rambler's calendar of fifty-two weeks among insects, birds and flowers. Roy. 8vo. Harper & Brothers, New York, 1892. pp. 322. Illust. \$5.00.

may discern." Every chapter is filled with interesting matters about these common objects, which will be largely new to the reader, whether young or old.

The author is equally familiar with the peculiarities and habits of flies, wasps, toads, squirrels, flowers, germinating seeds, pine cones, exploding pods, sleeping leaves, etc., and he studies them not as animals or plants, but as natural objects having an interesting history and curious behavior.

There is a division of the work for each week in the year, beginning with March. The first chapter deals with the flowers of the skunk-cabbage, the next with the behavior of maple seeds, the next with Pickering's frog, then antics of opening cones, and the ingenuity of squirrels, and so on for the fifty-two divisions.

Although the author writes popularly and mainly for young people, he does not sacrifice accuracy, and often supplies the Latin names when the common ones do not suffice for identification. Among the fungi only does he appear wanting in scientific information, e. g., regarding fairy rings and the exobasidium excrescences on *Azalea*.

But the best feature of this work is yet to be mentioned. There is an atmosphere pervading its every line that makes the reader feel that the chief advantage is to be gained by hunting up these and similar curious things himself. Herein the author has rendered a distinctively scientific service to biology. If boys and girls were trained in biology and biological methods of this kind, the oft made remark that the botany and zoology which a pupil knows when he comes to college are usually hindrances to his further progress in those studies would no longer be true, and much of the effort of the college teacher in training young men and women for investigators would be uncalled for.

A text-book of botany for pharmacy students.¹

In this new text-book we have no decided departure from previous ones. It is, however, a compact and well balanced presentation of the facts of botany which it is most important for students of medicine and pharmacy to know. If any criticism upon the balance of parts is to be made, there seems to us too much space devoted to the presentation of the classification of plants; but perhaps, considering the predominant place which this part of the subject has always held in the instruction imparted to such students, this book makes as great an advance as ought to be expected. For only one-third of the space is so used,

¹WARNEKE HERMANN:—*Lehrbuch der Botanik für Pharmaceuten und Mediciner; Einführung in das Studium der Pharmakognosie des Pflanzenreiches*. 8vo. pp. xii. 364. figs. 338. Braunschweig: Harald Bruhn. 1892.

and much of the morphology is really found in this section. The preceding 226 pages are devoted to an exposition of the external morphology of plants; an introduction to microscopic technique and vegetable anatomy; and an account of the structure of some of the more important drugs.

The morphology of the vegetative organs of the lower plants is dismissed with a few pages, a treatment which is only justifiable in consideration of the small part these plants play in medicine. Even from this point of view, it might well have been longer; what there is is good. The discussion of the morphology of the members of the higher plants is a compact and clear presentation of, for the most part, modern ideas, with comparatively few survivals of useless terminology. We cannot say so much for the account of the morphology of the flower of angiosperms in the systematic part, where Dr. Warnecke does not seem to be so much in touch with modern conceptions.

The section on anatomy (leaving out of the special anatomy of the selected drugs, regarding which we are not competent to express an opinion) is again a well selected and well arranged compendium of the elements of histology. Dr. Warnecke has shown good judgment in what he has put in and what he has left out. The treatment of secondary thickening, for example, so important for an understanding of the structure of most of the barks, stems, rhizomes and roots which come into use as drugs, is full and yet concise, though we do not approve of the way in which it is distributed amidst the special descriptions of these parts.

The illustrations throughout are for the most part original, sometimes too mathematical, but are excellently engraved and printed. The book really deserves translation into English for American students.

Minor Notices.

BULLETIN 45 of the Cornell University Agricultural Experiment Station treats of the cultivation of tomatoes. Bulletin 46 of the same station gives an account of the cultivated forms of mulberries and their specific relations. Sixteen varieties are mentioned as fruit bearing, of which the New American is recommended. These sixteen varieties belong to five more or less distinct general types or species, *Morus alba*, *M. latifolia*, *M. Japonica*, *M. nigra*, and *M. rubra*. The latter, our native species, Professor Bailey looks upon as the probable progenitor of the American mulberries of the future.

IN ITS BEARING on the feeding of plants, investigation of the physics of the soil is of prime importance. Those who are interested in plant physiology should therefore take note of the recent work of F. H.

King, Professor of agricultural physics in the University and Physicist of the Wisconsin Agricultural Experiment Station.¹ For a considerable time Professor King has been studying the effect of various superficial causes upon the level of the water in the interstices of the soil. He has not only discovered a number of curious variations in this "water table," but has devised several ingenious pieces of apparatus for studying the complicated problems which presented themselves, and has been able to ascertain many of the relations between barometric pressure, rain-fall, temperature, seismic vibrations, cropping, manuring, etc., and the level of the ground-water. For details we must refer our readers to the papers themselves.

THE LIST OF mosses included in the catalogue of the flora of West Virginia by Millspaugh (see this journal XVIII, 34) has been separately issued as Contribution No. 32, from the Herbarium of Columbia College. Two new species of *Dicranodontium* are described, with excellent plates, *D. Virginicum* and *D. Millspaughii*. The latter is *Campylopus flexuosus* Sull. (non Brid.). Eighty-four species and varieties are enumerated.

A. S. HITCHCOCK, Professor of botany in the State Agricultural College of Kansas, has issued a useful descriptive list of the species and key to the genera of the "Woody Plants of Manhattan in their Winter Condition."² The list contains sixty-three native and four commonly cultivated species that have escaped. It was prepared originally for the use of the author's students. The nomenclature follows the Rochester agreement, and the sequence that of Gray's Manual.

OPEN LETTERS.

Is *Polyporus carnivorus*?

The article in the November GAZETTE entitled, "*A probable new category of carnivorous plants*," was read with much interest, although it seems to me that there should be considerable hesitation in accepting Prof. MacMillan's interpretations of the facts, for the following reasons:

1. The flies frequently found on the under surface of *Polyporus applanatus* do not seem to be there from any special preference for the

¹KING, F. H.:—Investigations relating to soil moisture. Extracted from the eighth annual report of the Wis. Ag. Exp. Sta., pp. 91-134. Also: Observations and experiments on the fluctuations in the level and rate of movement of ground-water on the Wis. Agric. Exp. Sta. farm and at Whitewater, Wis. U. S. Dep't of Agric., Weather Bureau, bulletin No. 5. Washington, 1892.

²Copyrighted and published by the author, Manhattan, Kansas. 8vo. pp. 20.